

CLAIMS

1. A production stabilizing device for forming a multicomponent film by melting and evaporating a vaporizing raw material (4) containing at least two sorts of metals, alloys or intermetallics compound in a single crucible or hearth (3) with use of plasma (7) converged by an electric field or a magnetic field, the device having an electric power supply unit (6) for melting and evaporating the raw material and a plasma control unit (9) for controlling the electric field or the magnetic field, characterized by

a means for melting and evaporating a part of the raw material (4) and then sequentially melting and evaporating an unmelted portion (4b) of the raw material.

2. The production stabilizing device according to claim 1, wherein said means comprises a sequentially increased electric power supply unit (6) which supplies first electric power necessary to evaporate the raw material (3) and then supplies electric power gradually increased from the first electric power at predetermined intervals repeatedly up to necessary maximum electric power to sequentially melt the unmelted portion (4b).

3. The production stabilizing device according to claim 1, wherein said means comprises a plasma control unit (9) which performs plasma control of converging the plasma (7) in a first plasma region

necessary to evaporate the raw material (4) and plasma control of continuously and sequentially moving and expanding the plasma from the first plasma region up to maximum plasma region to sequentially melt the unmelted portion (4b).

4. A production stabilizing method for forming a multicomponent film by melting and evaporating a vaporizing raw material (4) containing at least two sorts of metals or intermetallics compound in a single crucible or hearth (3) with use of plasma (7) converged by an electric field or a magnetic field, characterized by

melting and evaporating a part of the raw material (4) and then sequentially melting and evaporating an unmelted portion (4b) of the raw material.

5. The production stabilizing method according to claim 4, wherein the sequentially melting and evaporating the unmelted portion of the raw material (4) comprises supplying first electric power necessary to evaporate the raw material and then supplying electric power gradually increased from the first electric power at predetermined intervals repeatedly up to necessary maximum electric power to sequentially melt the unmelted portion (4b).

6. The production stabilizing method according to claim 4, wherein the sequentially melting and evaporating the unmelted portion of the raw material

(4) comprises converging the plasma (7) in a first plasma region necessary to evaporate the raw material and then continuously and sequentially moving and expanding the plasma from the first plasma region up to a maximum plasma region to sequentially melt the unmelted portion (4b).

7. The production stabilizing method according to any one of claims 4 to 6 further comprising using a sintered compact or a green compact (4) for the raw material.

8. A coated tool comprising a cutting tool base material of a high-speed tool steel, a die steel, a cemented carbide, a cermet or the like and a coating film of a nitride, a carbide, a boride, an oxide or a silicide containing a plurality of metallic elements and formed on the base material by the method of claim 4.